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Case report

Absence of the odontoid process with atlanto-axial subluxation; anaesthetic aspects

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Anaesthesia in patients with an unstable atlanto-axial joint is fraught with hazards.[1] Manipulation of the neck during intubation may lead to considerable subluxation in both flexion and extension movements, with pressure from the vertebral body and the odontoid peg. This can significantly reduce the sagittal diameter of the cervical cord, with the possibility of transient or even permanent neurological damage. The case reported is unusual in that in addition to atlanto-axial subluxation the odontoid process was completely absent.

CASE HISTORY. A 28-year-old man previously diagnosed as having ankylosing spondylitis was to have general anaesthesia for dental extractions. He gave a 12-year history of bilateral temporo-mandibular joint ankylosis requiring three surgical procedures under general anaesthesia, the most recent in 1987 involving gap arthroplasty with insertion of silastic blocks. Postoperative mouth opening was 20 mm. All surgical procedures required blind naso-tracheal intubation as mouth opening was insufficient to allow laryngoscopy. He gave a 10-year history of back pain, was HLA B–27 positive but X-rays of his thoraco-lumbar spine were normal. No cardiovascular or respiratory abnormality was detected.

Anaesthesia was induced using thiopentone 300 mg with gallamine 20 mg and alfentanil 1 mg. Gentle manual ventilation was commenced using 1% halothane in 66% nitrous oxide in oxygen. Otrivine nasal drops were instilled into both nostrils and blind naso-tracheal intubation was easily performed using a 9 mm cuffed endotracheal tube. Extubation was carried out whilst deeply anaesthetised.

Prior to anaesthesia the dental house surgeon had ordered a lateral X-ray of the upper airway, but this was not considered helpful as it really was a lateral view of the cervical spine. Some days postoperatively a radiologist noted that there was marked atlanto-axial subluxation. In follow-up, plain films of the lateral cervical spine in flexion, extension and neutral positions demonstrated considerable

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atlanto-axial instability (Figs 1 and 2). The odontoid peg was absent. In the neutral and extension positions there was posterior subluxation of C_1 and C_2 on the rest of the cervical spine. This was of the order of 5 mm and was further increased in the extension position to almost 7 mm. The flexion view demonstrated about 5 mm forward slip of the atlas on the axis and the rest of the cervical spine. There was evidence of both anterior and posterior subluxation of the atlanto-axial joint, but there were no distinct neurological sequelae.

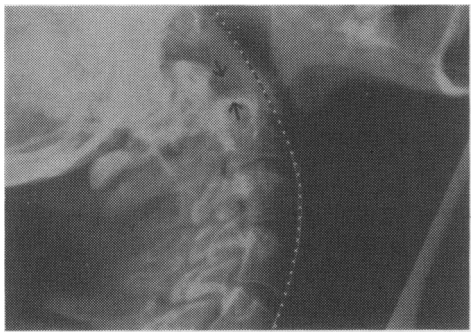

Fig 1. Lateral view of the cervical spine in extension. The dotted line shows the anterior border of the cervical spine. The odontoid process should extend upwards from C_2 to between the two arrows so preventing the backward subluxation of C_1 on C_2.

Fig 2. Lateral view of the cervical spine in flexion. The odontoid process should be between the two arrows.

DISCUSSION

Anaesthesia had been carried out on this patient on four occasions, each requiring blind naso-tracheal intubation, without any abnormality of the atlanto-axial joint being suspected. He had been suspected of developing ankylosing spondylitis on the basis of a long history of back pain, temporo-mandibular joint ankylosis, and he was positive for HLA B–27. The radiological findings in his cervical spine were attributed to ankylosing spondylitis, but it is more likely that they are a result of a fall in childhood, when he sustained severe head and neck trauma, resulting in bilateral mandibular condyle fractures. This caused subsequent temporo-mandibular joint ankylosis and retrognathism, requiring many attendances at hospital for reparative surgery. Presumably he had also fractured his odontoid peg at the time of the accident, and aseptic necrosis or failure of the peg to develop ensued.

The first case of odontoid hypoplasia was reported by Roberts[2] in 1933. Up until 1962 only 22 cases were reported in the literature when Gwinn and Smith reported the first case of acquired absence of the odontoid process.[3] Agenesis or absence of the odontoid process is a rare anomaly whereby no extension of the odontoid process above the body of the axis is present. It may be congenital or, more rarely acquired. When congenital, it may be an isolated anomaly or associated with the mucopolysaccharidoses and other syndromes.[4] When acquired, it is believed to result from aseptic necrosis following trauma, or it may be secondary to cervical infection such as tuberculosis. It has also been seen in severe cases of rheumatoid arthritis.

This degree of instability of the atlanto-axial joint would be likely to cause significant neurological impairment were it not for the absence of the odontoid process, so that the cervical cord is not subject to pressure when the subluxation occurs. This case is particularly interesting because the patient had undergone four blind naso-tracheal intubations before absence of the odontoid peg and atlanto-axial instability were noted. The instability caused by the absence of the odontoid process is relatively mild and only in the most severe cases is surgical fusion of the atlanto-axial joint necessary. Despite the lack of neurological sequelae during neck movement in this case, we would consider it prudent to intubate such cases in future using fibre optic laryngoscopy, provided that the problem is identified in the first place.

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